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of the base in conformity with the current and according to the general principles already so fully laid down.

665. This view of the oxidation of the metal, or other *direct* chemical action upon it, being the sole cause of the production of the electric current in the ordinary voltaic pile, is supported by the effects which take place when alkaline or sulphuretted solutions (666, 678) are used for the electrolytic conductor instead of dilute sulphuric acid. It was in elucidation of this point that the experiments without metallic contact, and with solution of alkali as the exciting fluid, already referred to (619), were made.

666. Advantage was then taken of the more favourable condition offered, when, metallic contact is allowed (630), and the experiments upon the decomposition of bodies by a single pair of plates (634) were repeated, solution of caustic potassa being employed in the vessel *v*, fig. 37, in place of dilute sulphuric acid. All the effects occurred as before: the galvanometer was deflected; the decompositions of the solutions of iodide of potassium, nitrate of silver, muriatic acid, and sulphate of soda ensued at *x*; and the places where the evolved principles appeared, as well as the deflection of the galvanometer, indicated a current in the *same direction* as when acid was in the vessel *v*; *i.e.* from the zinc through the solution to the platina, and back by the galvanometer and substance suffering decomposition to the zinc.

667. The similarity in the action of either dilute sulphuric acid or potassa goes indeed far beyond this, even to the proof of identity in *quantity* as well as in *direction* of the electricity produced. If a plate of amalgamated zinc be put into a solution of potassa, it is not sensibly acted upon; but if touched in the solution by a plate of platina, hydrogen is evolved on the surface of the latter metal, and the zinc is oxidised exactly as when immersed in dilute sulphuric acid (598). I accordingly repeated the experiment before described with weighed plates of zinc (599, etc.), using however solution of potassa instead of dilute sulphuric acid. Although the time required was much longer than when acid was used, amounting to three hours for the oxidisement of 7.55 grains of zinc, still I found that the

hydrogen evolved at the platina plate was the equivalent of the metal oxidised at the surface of the zinc. Hence the whole of the reasoning which was applicable in the former instance applies also here, the current being in the same direction, and